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NICOYA, COSTA RICA, TRANS-PENINSULA GPS EXPERIMENT AND INTER-PLATE COUPLING

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We have been carrying out a GPS (Global Positioning System) observation project in Nicoya peninsula, Costa Rica, since 2001. Costa Rica is located in the western margin of the Caribbean plate, and the Cocos plate is subducting beneath the Caribbean plate from the Middle American Trench. The convergent rate between these two plates is about 90mm/yr in this area. Because of this rapid convergence, large earthquakes often occur at the western coast of Costa Rica. The Nicoya subduction segment in northwestern Costa Rica has ruptured with large earthquakes in 1853, 1900 and 1950. Recently, two large earthquakes occurred around this peninsula (Mw 7.0 in 1990 to the southeast and the 1992 Mw 7.6 off Nicaragua to the northwest). There is a clear seismic gap, the ″Nicoya seismic gap″ between the rupture areas of these two earthquakes. In the Nicoya seismic gap, a strong coupling of the two plates is manifested by low background seismicity, the sharp edge of aftershock zone of the 1990 and 1992 earthquakes (Protti *et al.*, 1995), and the northeastward movement of the Nicoya peninsula recorded with GPS observations (Lundgren *et al.*, 1999).

Protti *et al.* (2001) estimates that a Mw=7.5 earthquake is likely to occur in the Nicoya seismic gap. Since Nicoya peninsula lies above this gap, GPS observations in this peninsula provide invaluable data for various studies about the seismic coupling, the updip and downdip extends of the seismogenic zone and the potential earthquake. Thus we started a new GPS survey program in Nicoya peninsula in 2001 by Observatorio Vulcanológico y Sismológico de Costa Rica, Universidad Nacional (OVSICORI-UNA) and Japan Marine Science and Technology Center (JAMSTEC) with support of the Japan International Cooperation Agency (JICA). Seven new benchmarks for GPS campaign observations were installed completing a 10 sites transect across Nicoya peninsula (Obana *et al.*, 2002). In 2002, the project was progressed by OVSICORI-UNA, JAMSTEC and Earthquake Research Institute, University of Tokyo (ERI) as a cooperative operation of JICA. The second campaign observation was held during the period from September 23, to October 12, 2002, and we obtained displacement vectors from the data. We will be presenting the results of GPS campaign observations and results from one-dimensional inversion analysis about inter-plate coupling using obtained displacement data.